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WHEN YOU BUILD

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BY

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MEMBER OF THE AMERICAN INSTITUTE OF ARCHITECTS

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Plans, sketches and photographs
of houses designed and constructed
under the direction
of MR. ELLIS

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An attractively laid out street, houses well placed and trees set in space between sidewalk and curb.

Why Employ An Architect

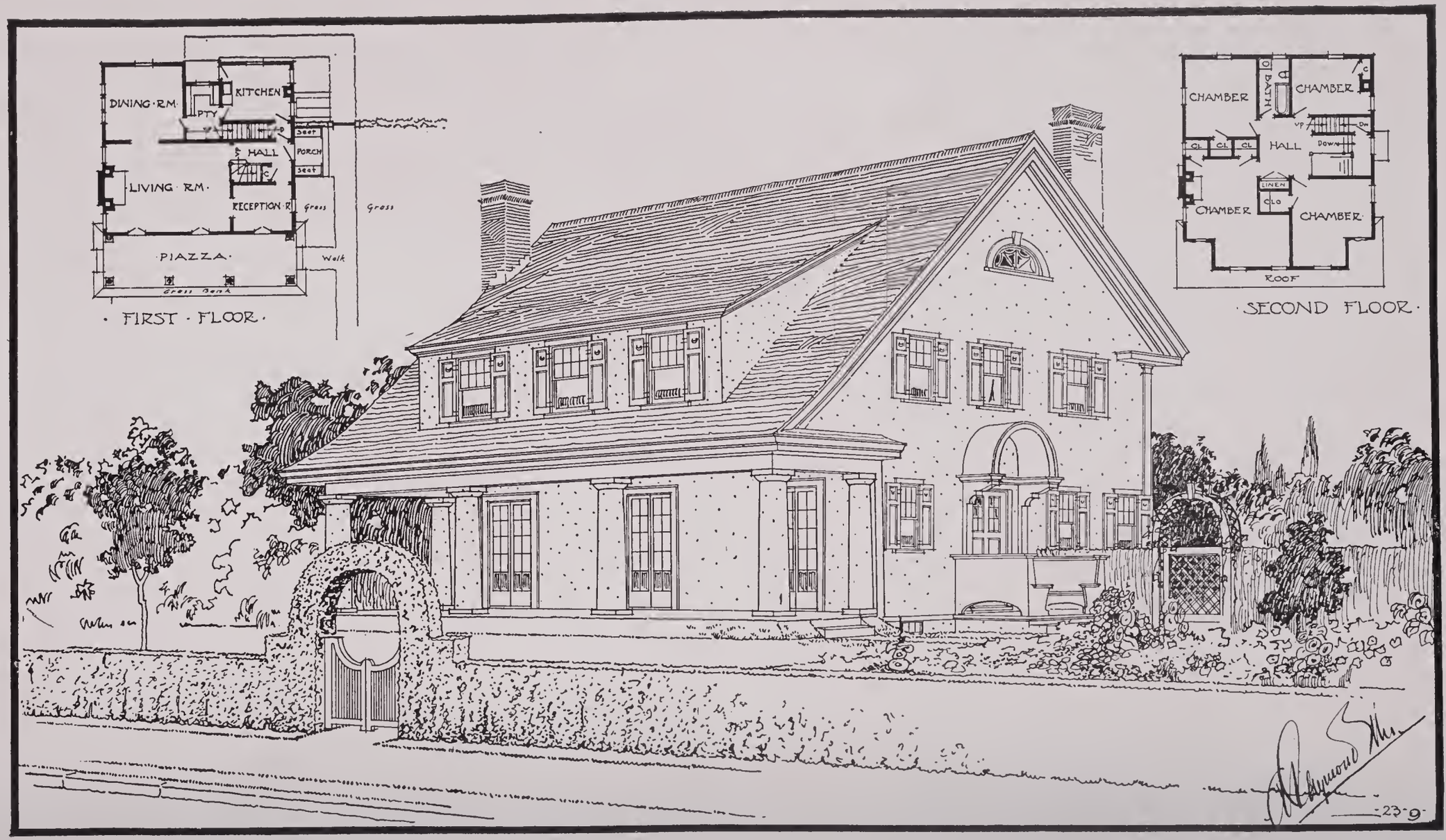
TO PLAN and arrange a new house carries with it a great deal of pleasure, which is continued when the house is actually occupied by the family. At the same time, a house carefully and economically built is a wise investment, for if people outgrow their first house, and it has been well built in a good neighborhood, it can be sold at a fair increase.

Unfortunately, the small house of moderate cost in the United States is in most cases poorly designed—this is not so true of larger houses. This is unfortunate, because a home need not be expensive to be comfortable or attractive. It is probably due to the fact that the man of means employs an architect to plan and design his home; but the man of moderate means too often determines to do without an architect, to reduce the cost and lessen the financial burden of building.

It has been said that the architects of this country are responsible for this condition, although indirectly; because there is little incentive to the successful architect to design small homes, when he can secure larger commissions from commercial and public work, or from more expensive houses. The time involved in making the plans and supervising the construction of a small house is almost as great as that consumed in one twice as large; but the larger house pays twice as much commission. The smaller the house the more skill it requires to design it economically. Furthermore the client often does not know clearly what he wants, and this involves the architect in needless expense in making sketches to work out some impractical scheme that the client thinks is ideal.

Many people believe that they can plan a house with the aid of a builder, or use roughly drawn plans, and thus save the architect's fee. This is a great mistake, for today building is more complicated than ever before, because of the great variety of changing materials, methods of construction, and building laws. From my experience, I am convinced that the architect saves his fee by obtaining a better planned and more economically constructed house, and one that will sell more readily than if built without technical advice. I think that most people who have built houses, concede this.

Since the need of good plans is imperative, I can see no reason why reputable architects who have designed small houses cannot help by selling these plans



This Colonial cottage is very compact and therefore economical to build. (See photograph on opposite page.)

Photograph of the Colonial house on opposite page as built by a Companion reader in 1908.

at a nominal price. These complete plans of small houses with their specially written specifications are sufficient for any good builder to work from without the continuous supervision of an architect, in many cases where the owner desires to save, and far better results will be obtained than if no professional plans are used.

Frequently the owner does not understand just what the duties of an architect are. Any architect would be glad to explain this clearly, and also explain what plans should cover. Briefly, plans consist of a set of drawings which cover every part of the building. This is necessary so that the contractor can make an intelligent estimate of the cost, and then erect the house properly from them. The specifications describe the kind of material, and together they furnish a complete plan and description of the building. Besides the advantage to the contractor of being able to submit a figure to cover the building described, in case of a law suit, these same plans and specifications represent clearly what you are entitled to receive from your contractor; but without complete plans and specifications it is very hard to establish your claim.

The American Institute of Architects, recognizing that the difficulties involved in designing a small house are more than in a larger house, recommend 10% of the cost as the architect's commission for designing houses costing less than $10,000., while for houses costing more than $10,000, they recommend a minimum fee of 6% of the cost, although many architects charge 7%. In case partial service is furnished, the fee may be sub-divided as follows: one-fifth of the fee is charged for preliminary sketches, three-fifths of the fee is charged for the revised sketches, working plans and specifications, and the balance of one-fifth is charged for superintending and furnishing the full-size details during the construction of the house. In addition to this, it is customary to charge traveling expenses to the work from the architect's office, when the work is outside of the city. If surveys or expert advice are required on account of unusual problems arising, or legal advice is required, these expenses are to be paid for by the owner in addition to the above charges.

The architect's preliminary sketches are made on thin paper in pencil and are submitted to the client for his approval, or suggestion or changes. They are revised, and when finally satisfactory are made into working drawings from which the blueprints are taken, the contractors figuring and working from these.

How to Finance the Building Cost

MANY people do not understand the financing of a house, and feel that a mortgage or loan is to be avoided like a debt. On the contrary, it is considered very good business for a man who wishes to own his own home to purchase a lot for $1,200, or $3,000, on which he pays half and gives a mortgage for the balance; he then builds a house which may cost him $5,000, or $10,000. He may be able to pay for one-half the cost of the house from his cash on hand or savings during its construction, and upon its completion give a mortgage to a bank to secure the money to pay the balance. It is advisable to place the mortgage with a bank rather than with an individual, and banks are very glad to get good mortgages of this kind. It is necessary to have and to expend for land and house, in order to build, about one-half the cost of both. And you can readily obtain from the banks a mortgage for the balance at the prevailing interest rates. This mortgage can be reduced from time to time; but today there are very few houses or buildings without mortgages on them, as it is a recognized part of the proper financing of any building.

Another way of financing is to take shares in a "Building and Loan Association," and then borrow according to the association's schedule. There is no risk in building a house on this basis if it is well planned and located. It is a good investment for you as well as for the town, and makes you a better and more desirable citizen.

At the same time you should not plunge wrecklessly into debt. The advice of a good banker should be obtained if you are not familiar with the methods, as they need careful explanation. In dealing with institutions, you should be perfectly frank, and state exactly what the property is costing you and your idea of valuation. If a bank agrees to take a mortgage on the property, they will probably be willing to recommend an attorney who is satisfactory to them to search the title and make out the necessary papers for the transaction. Avoid concerns who advertise to loan money on mortgages. Their rates are usually high, and in addition they charge a commission or bonus.

To sum up, there are three recognized ways of financing a building:

The first way is to pay fifty percent of the cost of the land and building in cash, and borrow on mortgage the other fifty percent.

The second way is to borrow fifty percent on the first mortgage, twenty-five percent on second mortgage, and pay in cash the balance, which is twenty-five percent. Second mortgages are taken only with a time limit. These run for perhaps a year or a year and a half. They are at a higher rate of interest than the first mortgage, and are not renewable. On choice residential property these second mortgages are very safe investments for a short time; but the sum of the first and the second mortgage should not exceed the price the property should bring at a forced sale.

The third way is to take shares in a local building and loan association. These associations are, I believe, very reliable. They can be easily investigated, however, by the borrower as to whether their reputation is good and whether they loan on local property only, which is essential. The above three methods are the best known, and those generally used in financing a building proposition.

Selecting the Site

THE utmost caution is necessary in choosing the site, because it is here that the first vital mistake can be made, as it is very hard for the inexperienced to determine which is a good site and which is a poor one. It should be borne in mind that the seller is interested in disposing of the property at the best price that he can obtain, and therefore it is important to deal with people who are reliable. Investigation of the adjoining property will provide an accurate basis for determining its value. Of course, a high and dry site is better than one that is low and swampy. One with trees is usually better than one without

A rare combination of ideal site, beautiful trees and a Colonial stucco house designed to suit it.

trees. An investigation of the houses and the people in the vicinity of the proposed site will determine the desirability of your neighbors.

In selecting a site much depends on whether you desire to build in the country, near a growing city or town, in the suburbs, or in the residential section of a city or town. In the first instance the land is without any improvement, such as sewers, water, gas, electricity, telephone, sidewalks, improved streets, and is perhaps some distance from transportation lines. If the land is being developed by a real estate company which is laying out temporary streets and cutting it into small lots, the clever salesman is apt to make the proposition very attractive with the easy payment plan. This land will be cheaper than the land in the well-developed suburb where all improvements are obtained, but developed suburban property is a safer investment and more salable.

You must not expect to find low tax rates in the sections most highly developed; but I believe these sections are preferable, and the additional tax rate is well worth the additional benefits, when you consider the protection to your investment by being in a police and fire district.

The following are some of the details that must be considered in selecting any site:

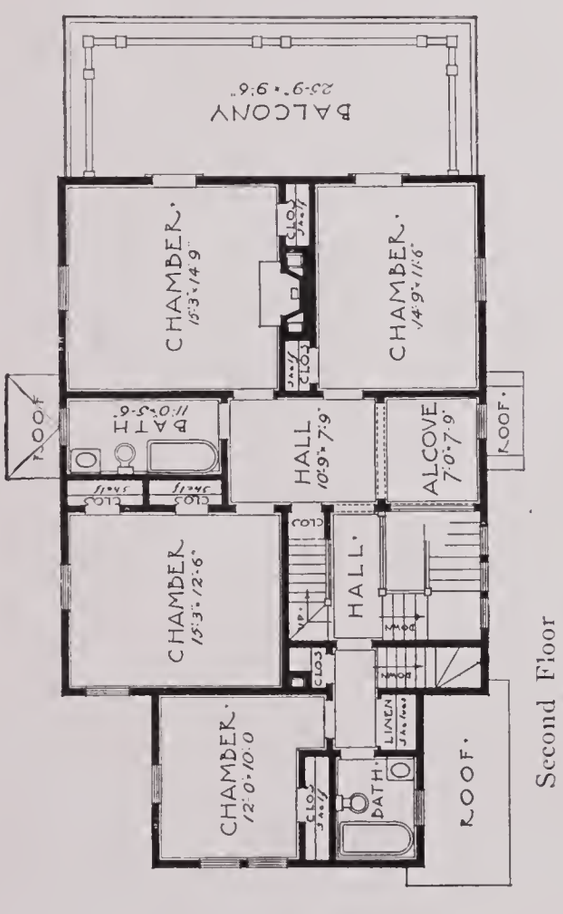
1. The means of transportation, and kind of churches.
2. Water supply. City water is preferable, and lake water is to be avoided.
3. If you have children, is there a school nearby?
4. Can groceries be delivered? Is it necessary to fetch and carry everything used in the house? Are ice and milk available?
5. Is there a sewerage system, or must you depend upon a cesspool or disposal plant?
6. Are elecricity, gas, telephone, and mail service available?
7. Is there much grading or filling necessary in order to build upon the site?
8. Will roads have to be built?
9. If there are large boulders or ledge rocks on the site, it means blasting, but the stone can, of course, be used for the foundations and cellar.

The subdivision of large tracts of property is about as follows:

The property is surveyed and laid out in plots with regular streets and avenues, with an established building line (see illustration, page 3).

Where a higher type of development is required, the property is laid out with more care in larger plots, and the straight streets and avenues are not as essential as picturesque winding roads following the natural contour of the ground. Proper regard is paid to the orientation of the lots, as well as to see-

This plan was designed to suit a narrow lot with the end toward the street. The shingled exterior with its hooded entrance porch on the north and enclosed sun room on the street end is very unusual.



In the above plans notice that the living room and dining room are on the south. The second floor is arranged so that all chambers are cross ventilated and sunny

ing that the roads are laid out so that an average grade can be maintained between properties, avoiding sharp drops at party lines, and at the sidewalks.

Examine each site and compare its advantages and disadvantages before choosing, and if you are going to employ an architect, have him see the site and give you his opinion and advice. There are many things about a site that would make building upon it expensive: too much slope in any direction means expensive foundations and grading; if too low, poor sewerage connections and expensive filling.

The architect is familiar with the setting of buildings, and makes a mental picture of the scheme best suited to the location, and it is not wise to settle upon a style until your architect has seen the site. If you prefer Colonial, then search for a site suited to a Colonial house, or choose the site and fit the type of house best adapted to it. Trees are always an advantage, as they form a screen or a background, and give proportion to the house, while their shade is particularly desirable in the summer; but they should not be too close to the house. With a rough, irregular site, select a more rambling type. Your architect will probably choose a design that develops the views and the natural beauties of the site. You must also consider which is the best exposure for a house on any given site (see illustration, page 7—a house with a southern exposure and garden.)

Placing the House

THE way a house is placed, as we all know from personal experience, exerts a powerful influence on the character and disposition of its occupants. If it is cold and cheerless in the morning, because the sun cannot get in, this cheerlessness is reflected in the spirits of the family.

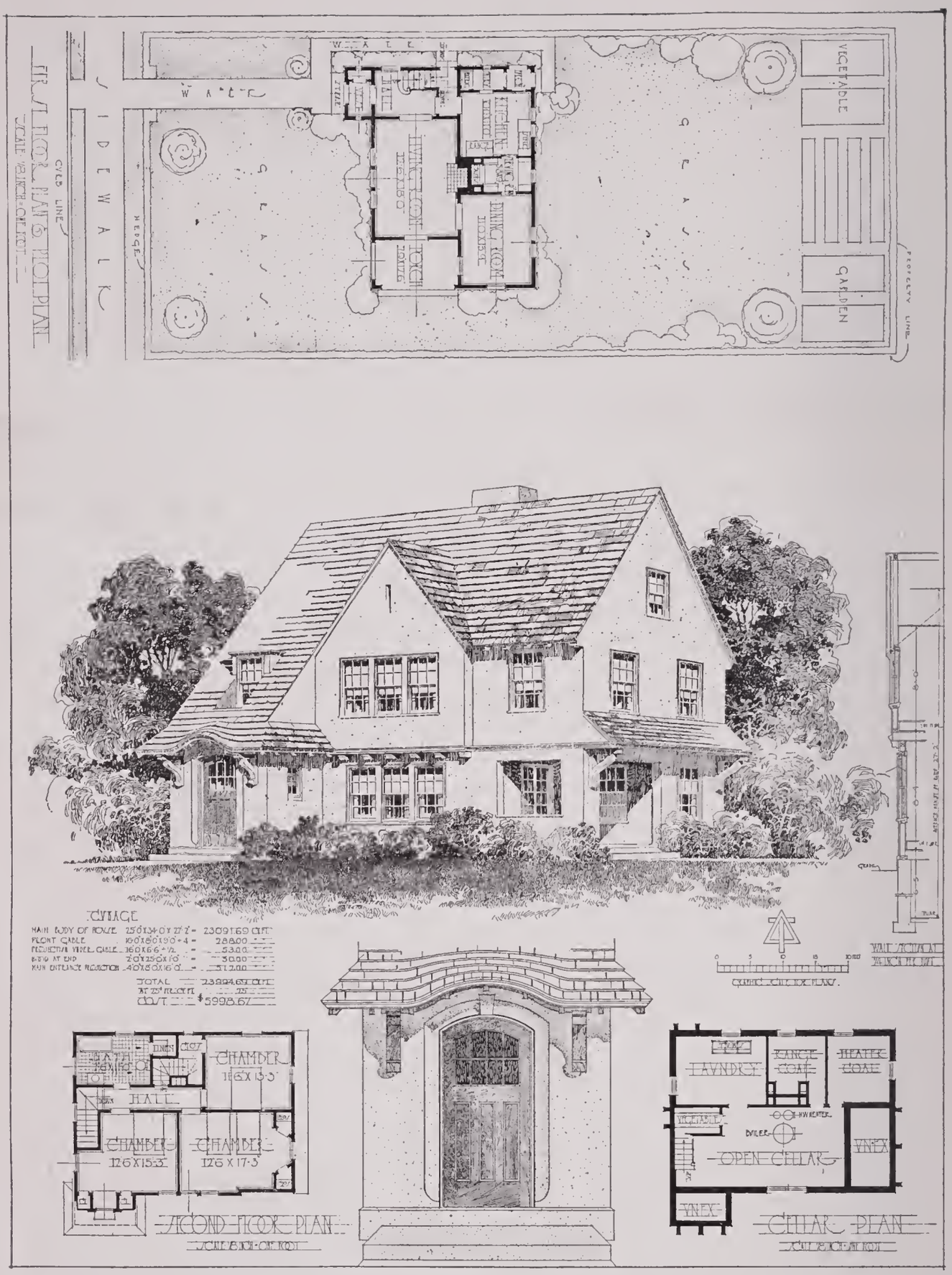
Although all rooms cannot have a southern exposure, certain rooms should be located with regard to the compass—Orientation this is called in technical language. The dining-room on the east, or southeast, receives the morning sun, making a pleasant room to breakfast in. The living-room should face the south, southeast or west, or run east and west to make it pleasant most of the day, but particularly in the afternoon. The kitchen, and less important rooms may be on the north side, although in a small house it is often best to place the kitchen on the east to receive the morning sun and make it a pleasant place in which to start the day's work. (See illustration, page 10.)

Consider from the first the landscape effect, whether formal or informal, and the cost of upkeep of shrubs, lawns and drives, when deciding the location, and whether you wish to have a small vegetable garden in the rear. Even the back yard is no longer left unadorned, but, divided by hedges, trees and gardens, provides a beautiful outlook on green lawns or attractive gardens, with all objectionable features screened by shrubs. (See plot plans on pages 10, 11 and 35.)

Houses should set back from the sidewalk at least thirty-five feet. In my opinion, a lot should have a frontage of not less than seventy-five feet by a depth of at least one hundred and seventy-five feet. Lots having a frontage of only fifty feet bring the houses so close together that the privacy of the home is destroyed, and there is not room enough between the houses for trees or shrubs or even sunlight. The danger of a conflagration is greater, also, when houses are set close together.

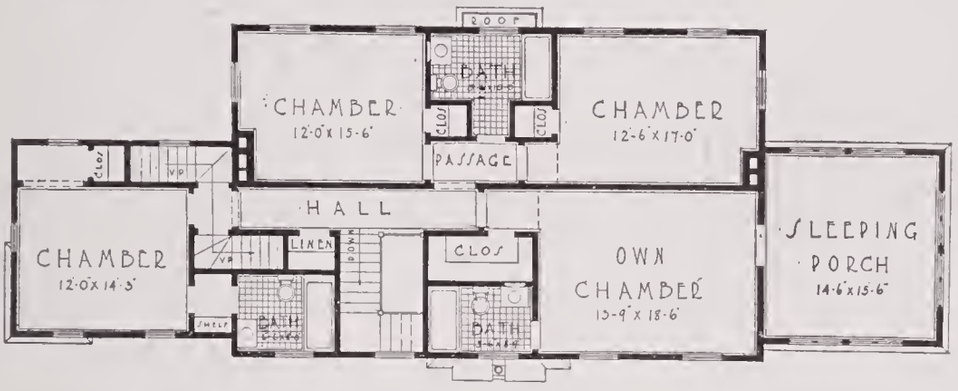
The cellar windows should be of good size, and if a low setting is desired for the house, it is advisable to place the windows in areas. This will depend upon the style of the house. A house which stands on a slight elevation should set lower than one which sets on a depressed site.

The house can be placed on a narrow lot if set with the living-room end toward the street, having a walk to the front door on the south side and the driveway and tradesmen's entrance on the north side. This would leave room for a garden and garage at the rear. The proper location for the garage would be at the end of the lot on the kitchen side. (See illustration, page 8.)



THIS *interesting and livable house is ideal—the kitchen and dining-room are on the East, the living-room on the West, the porch on the South. (See plan top of page.) The second floor contains three chambers and can be arranged for four, with two more in the attic.*

THE *exterior of the house is stuccoed and a background of trees, with shrubs in the foreground, sets off the design to advantage. A study of the way the house is placed and the plot of ground laid out (shown at top of page) will prove well worth while.*

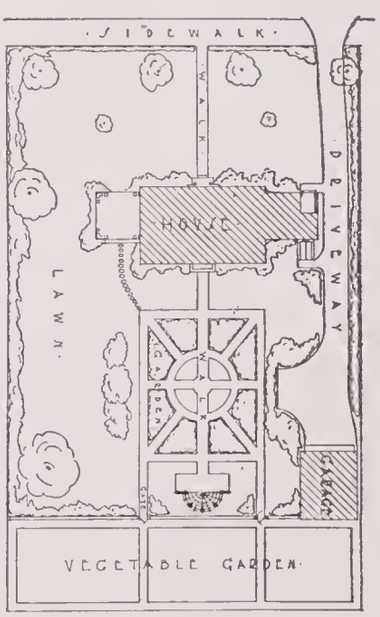


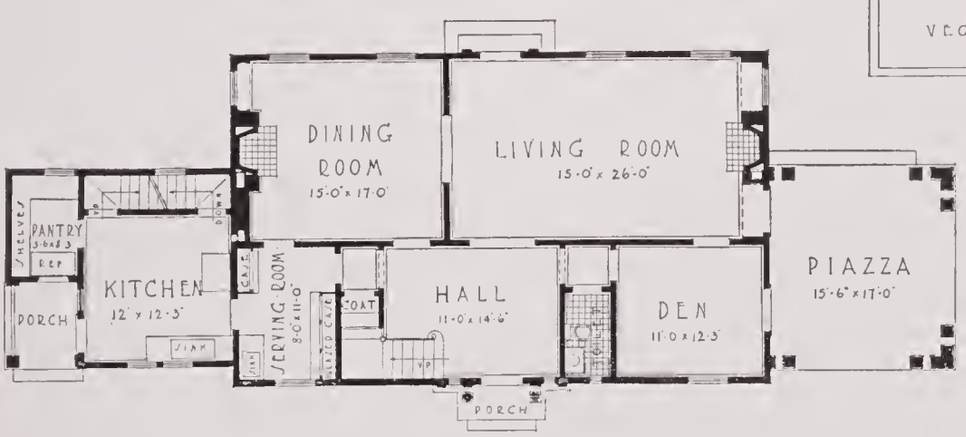
Second Floor

THE plan of this house demands a lot with a wide front facing West, as the dining-room and living-room are on the East (in the rear of the house), overlooking the garden.

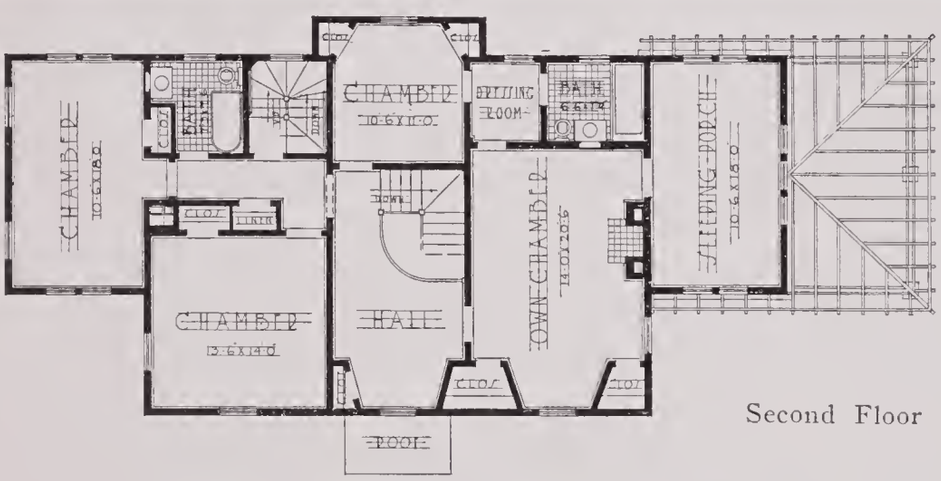
The front elevation represents the most modern adaptation of the Colonial style to the elongated plan with North and South axis, a type suitable for suburbs or country, and a most satisfying one.

The second floor contains all the features considered essential in the up-to-date country or suburban house, including a commodious sleeping porch.





First Floor



Second Floor

A HOUSE *the author designed for himself, which proves what he preaches—that proportion and simple detail, properly related, make a quaint Colonial house.*

THE *first floor was worked out to serve its utilitarian purpose as well as to be comfortable .and .attractive. The second floor, with the owner's .suite on the South, leaves the two chambers and bath at the North end for the guests or members of the family.*

First Floor

Choosing the Style of House

STYLES in architecture are many and varied. In different sections of the country we find them adapted to meet the climatic conditions, and the topography, and available natural building products. In New England, we find many fine Colonial examples of large and small houses; in the South, low, rambling one-story bungalows, and houses with two-storied piazzas or galleries to protect the rooms from the sun. In the extreme West, the old Spanish missions have furnished us ideas for many types. Sprinkled here and there through the country we also find Swiss chalets, English cottages with stucco panels in the gables, houses with French or Italian villa treatment, or a German adaptation, and the rest are purely American types.

The small country house and villas of Europe have had a good influence on American architecture, and have taught us that a house and garden to be successful must be one composition, designed at the same time. Their beautiful interiors have inspired us to treat ours more skillfully, with a better use of detail and woodwork, and the study of many of the smaller types will offer many unusual suggestions.

Extreme individuality is not advisable in small houses, as they are not salable. The house should be built with its investment value in mind. Good houses always sell quickly, but eccentric ones are not so readily disposed of.

Advise your architect of your likes and dislikes in plans, styles, decoration, and furniture. If you have no particular choice, it might be well to point out one or two houses that specially please you, as it will guide him as to your individual tastes. An architect is accustomed to obtain a good design by his arrangement of windows, roofs, and features, with regard to their proportion, and not by adding here and there features that are only intended to be ornamental. So the architect's beauty of design lies in the fact that it is simply a matter of the proportion of voids and solids inherent in the construction, and this beauty of arrangement, contrary to most popular opinion, adds nothing to the cost of the house. Aside from achieving beauty of design, the architect arranges the rooms so that the minimum amount of space is wasted, and from experience he knows at once the best arrangement that will allow a house to come within a fixed limit of cost.

Room Sizes and Ceiling Heights

MANY people when looking over plans for the first time are unable to determine whether the sizes are correct. I would, therefore, recommend the following sizes:

The entrance hall should not be less than 7 feet wide, and this will permit the stairs to occupy one-half of it, or 3 ft. 6 in.

The dining-room should not be less than 12 ft. 6 in. by 14 ft. 6 in.; a good size is 14 ft. by 15 ft.

A living-room 13 ft. by 18 ft. is about the minimum for a small family. A room 14 or 15 ft. wide by 27 or 28 ft. long is the average size used today, even in small houses.

A den can be 10 ft. by 10 ft., but 12 by 12 ft. is better.

The kitchen can be 11 ft. by 11 ft.; but 11 by 13 ft. is a better size. The serving-pantry should be about 10 ft. by 6 ft. A pantry 6 ft. square is ample.

The owner's chamber, if arranged for two beds, should be not less than 11 by 17 ft. Most owners' chambers are planned for two single beds, and many guest chambers are arranged the same way.

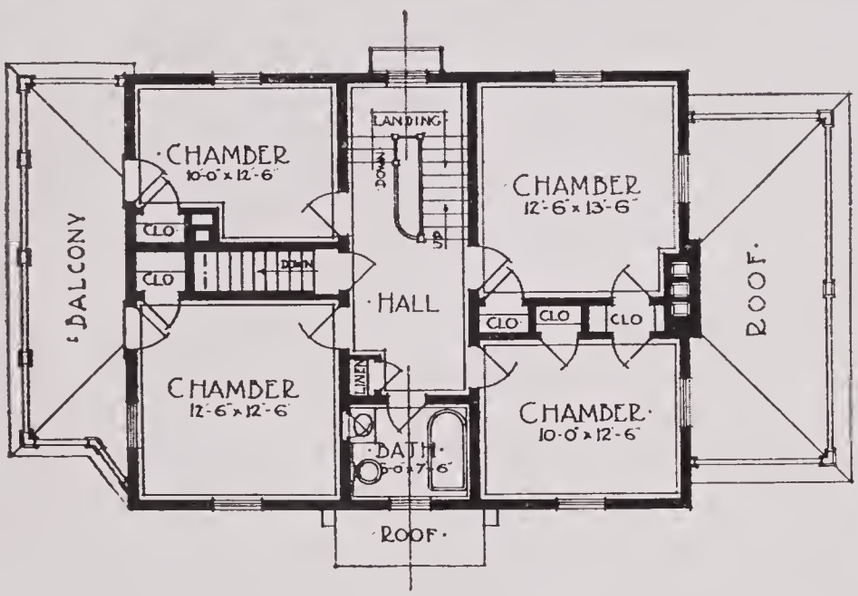
A single chamber can be 12 ft. 6 in. by 12 ft. 6 in., but a room 14 by 14 ft. is a better average size.

Maids' rooms should be designed for a single bed, and can be 10 ft. by 11 ft.

Bathrooms should be about 6 ft. 6 in. by 8 ft.

Rear stairways should be 2 ft. 8 in. wide.

While the above sizes are recommended from experience, I would advise clients to measure rooms of a size they like, in order to settle this point to suit themselves, particularly if they are endeavoring to reduce the size of the

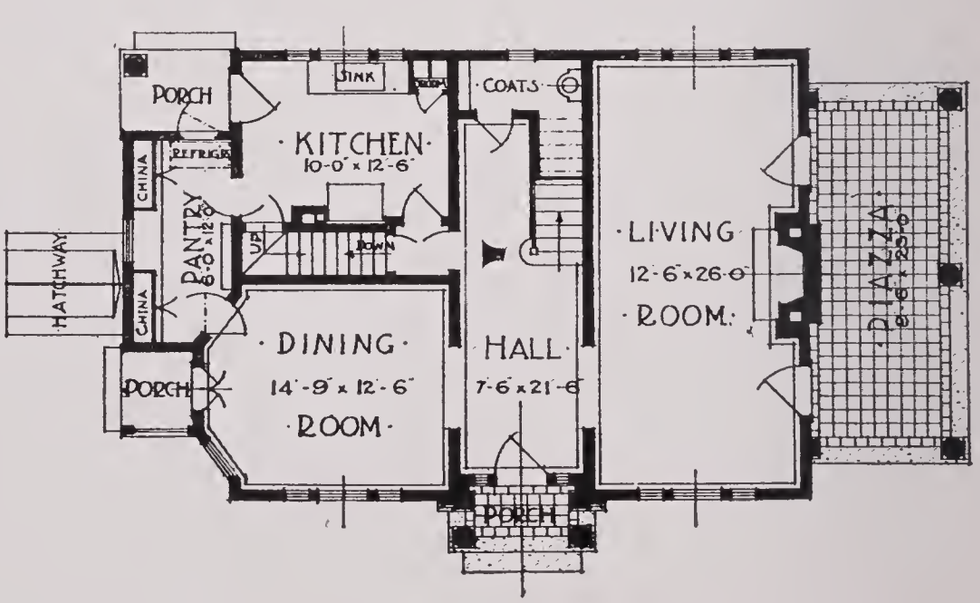


Second Floor

A CAREFULLY studied design in stucco for a small house. The plan is simple, compact and convenient—there is room for two rooms in the attic.

ON the second floor are four good-sized chambers, with ample closet space. From two of the rooms French doors open on to the upper balcony.

THE first floor opens up spaciously for a small house.



First Floor

house. In some cases the above sizes might be reduced, if the doors and window spaces did not occupy too much of the wall space. It is important to consider the available wall space for furniture positions. Some rooms are so badly cut up, and have so many windows and doors, that the available wall space is not sufficient, and some small rooms can be more attractively arranged, and even appear larger, because of the abundant space for furniture.

Ceiling Heights: The cellar should be not less than 7 ft. in height. The height of the first story varies. In some old New England houses a height of 8 ft. will be found. I think this is too low. I recommend 8 ft. 6 in. as the lowest ceiling height for a house with small rooms. The first-story ceiling height will be better in an average size house if 9 ft. high; and in a living-room 15 by 27, the ceiling should be 9 ft. high, and 9 ft. 6 in. will be better. Houses in the South require higher ceilings because of the intense heat. In New England the second story is usually 8 ft. 6 in. or 9 ft. high; in the South the ceilings should be a little higher. The attic should be not less than 7 ft. 6 in high. If a flat roof is used there should be a vented air space between the ceiling and the roof, as during the summer days this air becomes very hot unless it is constantly moving.

The Colonial as a Basis

TAKING as an example the Colonial square house having four rooms on each floor, and elongating it into a rectangular plan and providing it with the improvements usually required today, we have a comfortable house that is inexpensive both to build and maintain. (See illustration, page 11.)

Some Reasons for the Plan: The main entrance and hall in the center divides the house so that a well-balanced symmetrical front elevation is obtained, with good window arrangement. The two rooms on the left of the hall correspond to the old-fashioned front and back parlor, commonly made today into one large living-room, or, if two rooms, used as a den and sitting-room. The dining-room and kitchen occupy the other side, arranged so that the kitchen is isolated, with the service through the pantry, a more convenient way than formerly, when the kitchen opened directly from the dining-room, and the pantry or buttery was near the back door, perhaps forming a part of the wood shed.

On the first floor the small house requires an entrance hall, living-room, dining-room, serving-room, cold pantry, kitchen, coat closet, kitchen closet, as well as a piazza and rear porch. In addition, if any luxuries can be afforded, the front porch might be separated from the piazza so that the piazza can be placed at the south side and enclosed as a sun parlor. In very cold climates a vestibule should be provided to the front hall and a rear entry to the kitchen. A small room that can be used as a den or library is of great convenience. Back stairs are hardly necessary in the small house, and a toilet-room on the first floor is decidedly a luxury in the small house.

The second floor usually contains two large chambers and two small ones, with a closet for each, a bathroom, and a linen closet, and a small hall. Many houses today, even small ones, have two bathrooms on the second floor and a sleeping porch.

The attic should contain one chamber and a store-room, although many small houses today squeeze in two chambers and a bath and storage attic. The cost can be reduced by leaving the attic unfinished at the time of construction, to be finished later.

Entrance Hall and Main Stairs: As the entrance hall and stairs take up considerable room and as they give the first impression of the house, they must be planned very carefully, particularly in the small house. Generally, the most economical arrangement is to place the hall in the center of the house with the stairs toward the rear, as illustrated by numerous plans given in this booklet.

In connection with the front hall there should be a toilet-room or a coat-room. The portion used for a coat closet should be large enough to take both winter and summer coats, umbrellas, suit cases and the wraps of guests.

IN this sanitary kitchen, the walls and woodwork are painted buff and can be washed. The sink is of vitreous china with a wooden draining board each side, from one of which a slide opens into the serving-room.

THE serving-room is fitted up with a counter 35 inches high having glazed cupboards and drawers. Under the window is a sink for washing the china, silver and glasses. The refrigerator at the right is iced from the kitchen side.

Side or Rear Hall Entrance: An entrance sometimes placed at the rear of the main hall is convenient, if an entrance is desired from the garage or driveway, while the rear porch is carefully located to be convenient for tradesmen, leaving the front of the house with more unbroken lawn. Many Colonial houses had side entrances, which in later years took the form of a *porte-cochère* or covered carriage entrance.

Rear Entry: The rear entry is a feature which is omitted in many small houses. It is a very convenient feature, however, and if large enough it can be used as a place in which to hang up outer garments. A large shelf for the receiving of groceries should be placed near the door on the back porch.

Storage of Bicycles, and Children's Entrance: It has been found very convenient to arrange, in connection with the back porch, perhaps under it if the ground is low enough at the rear of the house, a space in which children can store their bicycles or outdoor playthings. Sometimes this is arranged in connection with the rear entrance on a level with the grade, so that the children come in through this entrance, leave their bicycles and playthings, take off their rubbers and outside garments and wash their hands, before going into the main house, thus saving much disorder and dirt.

Rear Stairs: From the kitchen or rear hall, the back stairs should lead to the second floor and to the cellar. They should be wide enough so that trunks and furniture can be taken up them, and should be heated so that they can be used to go up-stairs or to the cellar, without passing through the kitchen.

Service Arrangement

The route from the dining-room table to the china cupboard, supply cupboards, kitchen sink and range should be worked out to be in a direct line to save steps and make work easy. If a coal range is used, it should not be too near the sink, otherwise the heat will be unbearable at times, and, unless the kitchen is well ventilated and well lighted, and has an eastern exposure, it will not be a pleasant room to work in. Near the range there may be a closet for pots and pans, although I prefer the old way of hanging the cooking utensils, shining and spotless, upon a rack back of the range.

A serving-room should be interposed between the dining-room and the kitchen, where silver, china and linen should be kept. The fine china should be washed in the serving-room. The serving-room has a counter around it thirty-five inches high, in which are drawers and cupboards; under the window is usually a copper sink for washing glassware, china, and silver. On the wall above this counter are cases of shelves for china, with glazed sliding doors. The kitchen pantry has a counter above which are open shelves.

Cold or Supply Pantry: In most small houses the pantry is too large, and in many cases the serving-room can be made to answer the purpose of both, with a refrigerator placed in it so that it can be iced from the rear porch or kitchen. However, where a small pantry is desired, it should contain a refrigerator arranged so that the door at the back opens onto a porch to receive the ice. The refrigerator drain should be connected with a small sink in the cellar, this sink being connected with the sewerage system, to eliminate the undesirable feature of continually emptying the drip pan. A pantry of this kind may be very small, yet, if conveniently

A dining-room of simple proportions and design allowing plenty of opportunity for the owner's individual ideas to take expression in the decorating, hangings and furniture. (Residence of A. R. Ellis.)

arranged, can contain all the supplies required in the small house.

Broom Closets: In a well-arranged house there should be a broom closet on the first floor, and one on the second large enough to contain a broom, carpet sweeper, dustpan, dust cloths, keys, floor polish, cleansing fluid, dusters and various other odds and ends that must be put out of sight. If a vacuum cleaner is used, the closet should be large enough to hold it also.

Linen Closet: Most housekeepers take great pride in the linen closet, and therefore feel that it should be a rather large and commodiously arranged affair. I have found that for a good-sized house the most economical linen closet is about 4 feet wide and 2 feet deep, with a pair of doors opening up the full width of it, and filled with shelves about 12 inches apart from the floor to the ceiling. Very few houses will require enough linen to fill this completely, and the excess space will be used for the storage of other things. I do not find it advisable to put flaps on the front of the shelves, or even to put in drawers, although this can be done if the housekeeper particularly desires it.

Built-in Features and Fireplaces

Built-in Furniture: The value of built-in furniture is somewhat doubtful. From my experience I have always felt that built-in furniture was not practical, as peoples' ideas are subject to change and that which might please one would not be pleasing to another.

The scheme of decoration of a room *without* built-in features can be changed occasionally to conform to the desires of the owner. However, if the owner has made up his mind to have built-in features, they should be included in the plans rather than added afterward as an extra expense.

Bookcases: These are of two types, open and closed. For an extensive library I prefer a small room with book-shelves running practically from the floor to the ceiling on four sides. Where the wall spaces are taken up exclusively by book-shelves, the shelves start about two feet six inches above the floor. The space below this is used for cupboards and drawers, and the space above for book-shelves with glazed doors. In small houses open bookcases are usually built in the living-room and are about 4 ft. 6 in. high, with shelves about 10 in. deep. Of course the open bookshelves are cheaper than cases having glazed doors; but glazed doors are a protection against dust and dampness.

China Cupboard: In the dining-room a china cupboard built into the wall or across a corner is very convenient. It should have drawers or cupboards at the bottom, and cupboards above lined with mirrors, with the shelves of glass. (See illustration of dining-room opposite.)

Built-in Seats are attractive and ornamental. Sometimes the space under the seat can be used to advantage for a woodbox of for storage of odds and ends. In the illustration on page 19, the space is used for a boxed-in radiator.

Clothes chutes from the second floor to the laundry are not advisable, because they serve as dirt catchers and breeders of disease, and in case of fire, act as flues.

A good fireplace is essential to every living-room, particularly through the winter season. A fire in an open fireplace is both cheerful and restful.

The fireplace should be constructed of brick, suited to withstand the fire, and should have a damper to prevent down drafts, and a well-built tight flue lined with flue lining. The size of this should be not less than 12″ by 12″, and for a larger fireplace 12″ by 16″ is better. The fireplace should be about 18″ to 20″ deep and about 3′ 6″ wide and 2′ 6″ high. In larger rooms the fireplace should be 4′ or 5′ wide. Some of the old-fashioned fireplaces were made of soapstone, with marble facings and hearths. Cement is not very satisfactory for a fireplace and cobblestones do not stand the heat very well and are suitable only for log cabins or bungalows.

For a well-finished house, I should advise a dark red brick fireplace, or a fireplace of soapstone with a marble

A living-room 15′ x 30′ with 9′-0 ceiling, although the beams make it look lower. At the end is a triple window and seat under which is the radiator.

A good Colonial dining-room, with an interesting built-in china closet. Notice the placing of the side lights.

A living-room 14′ x 30′ with 9′-0 ceiling, simply finished in stained gumwood and carefully furnished. The fireplace is of Roman brick and marble. (Residence of A. R. Ellis.)

facing. The mantel contributes much to the decoration of the room, and should be selected to conform to the architecture. In the living-room or dining-room the mantel and fireplace should be the predominating feature, and therefore the mantel should be architecturally interesting.

There should be an ash chute connected with a cleanout in the basement. Woodboxes take up so much room that I would suggest that a supply of wood might be kept in a seat or in a small oak chest. At the same time, if a log fire is made properly early in the evening it will about burn itself out by bed time, so there is no advantage in planning for a supply of wood in the living-room. Fire screens are advised for all fireplaces where wood is burned, to prevent sparks from flying out.

Interior Finish

BEFORE the specifications can be completed by the architect, it will be necessary for the owner to select the interior finish. By interior finish is meant the wood trim used around the windows and doors, the baseboards, stairs, mantels, cupboards, cornices, pantries, floors, bookcases, and seats, and whether they are to be painted or stained. There are a great many kinds of woods, the use of some being confined to particular localities. The reader will have no trouble in determining the kinds of wood and finishes if he observes other houses and consults his architect or builder. In the order of their cost the following finishes are recommended:

Yellow pine for kitchens and in service portion
Whitewood for general finish that is to be painted white
Cypress for stained and waxed finish

Fir for painted finish
Gumwood for stained and waxed finish
Birch or beech can be stained or painted
Maple can be stained or painted
Oak and walnut are best stained and waxed

Standing Finish: *The service portion* should be finished in hard pine, varnished or painted with buff sanitary enamel paint that can be readily washed, with the plastered walls painted with the same material. Wall papers should not be used in the service portion of the house.

The finish of the dining-room, hall and living-room, if to be painted, should be whitewood, or some other wood that takes a good paint and enamel finish. If the finish of these rooms is to be stained, I should recommend gumwood or oak, as the two woods with which the most attractive and economical results can be obtained. (See illustration, page 20.)

The finish of the chambers and bathrooms is more attractive if painted white and enameled, and in such case whitewood or pine can be used; but if the woodwork of the chambers is to be stained, I should recommend beech or gumwood. Sometimes whitewood is used, but chambers lend themselves better to schemes of decoration when the finish is painted or enameled, as is shown in the illustration below.

Wainscoting: Wainscots are very desirable in certain rooms and should conform to the architecture of the room very closely. A low wainscot with oblong panels is very appropriate in the front hall up the stairs and in the second floor hall. Such a wainscot is also very pleasing in the dining room. Sometimes the wainscot in the dining room is made about 5′ 6″ high, the top member forming a plate shelf. Such wainscots are not strictly Colonial and are better carried out in dark stained wood.

In the English style are many very attractive forms of wainscots carried out in oak, in many cases extending from floor to ceiling.

Cornices: A cornice is an arrangement of mouldings forming the finish

In the owner's chamber a fireplace is a very practical as well as decorative feature. In case of illness it is especially appreciated.

A typical Colonial hall, with the exception of the sliding glazed doors to dining-room and living-room, which are very useful at times: but heavy curtains are more decorative.

at the junction of the side wall with the ceiling. The bottom member is a picture mould. In many houses important rooms have nothing but a picture mould at the ceiling, while perhaps the lower portion of the room is finished with heavy woodwork. The lack of finish in the upper part of the room is then very apparent and it is only by the addition of a properly porportioned cornice that the finish can be properly balanced to give a good architectural effect.

Finish Floors: *The hall, den, living-room and dining-room,* regardless of style, usually have quartered white oak floors, as these are the most satisfactory; but if they cannot be afforded, plain oak will do. Oak is undoubtedly the best wood to use for floors. White oak is perhaps a little harder than red oak, but red oak runs more even in color. Quarter-sawed oak is more durable than plain sawed oak, but it is also more expensive. Be very careful to purchase thoroughly kiln-dried flooring—the ordinary manufacturer does not take enough care in this respect.

For kitchen, bathroom and upper hall, it is difficult to find a better wood than maple. Maple has a fine, even color and grain, is not as expensive as oak, and is rapidly gaining in popularity. The kitchen and pantry floors may be rift grain North Carolina pine, although many are now covered with linoleum.

For the second floor the selection of flooring depends upon several things. If rugs are to be used, spruce or pine floors are good and they can be either painted like the old Colonial floors or be left without any painter's finish.

Details: The detail and pattern of the interior finish is a matter with which the owner will not be familiar. In order to have an attractive interior, it is necessary to have well-proportioned doors, windows and molded finish of nice detail. Where a painted finish is used, the architect will use a more delicate detail than when the finish is to be stained, and certain styles require certain moldings; but if an architect is employed he will take care of these points, otherwise the owner must de-

pend upon his own taste for selection, based on his observation of that used in other houses. The cost of houses can be kept down by the use of stock materials. Today the cost of the doors and windows, mantels and trim has been greatly reduced by the manufacturers adopting patterns that are called stock, because they make up large quantities of them at one time. Stock doors and sash are to be recommended. (See next page.) Mantels are, as a rule, better if made from an architect's detail, as is the interior finish.

Generally speaking, interior finish that is to be painted, requires more skill in designing and requires the use of delicate detail, but woodwork that is to be stained and waxed, can be simpler, with broader surfaces. To a person familiar with building, poor detail is very apparent, and is particularly noticeable in cheap houses, where the moldings are coarse and heavy and lack proportion.

A house should not be finished until the interior plastering is thoroughly dry. It is very important that, as far as possible, the shrinkage and seasoning

A Colonial staircase with spiral rail gracefully eased and ramped at the newel posts. A palladian window motif decorates the landing, and a coat closet and den are arranged for underneath the stairs.

should take place in the house before the interior finish is put in place. If the house can stand for a month after the plastering is finished and carefully dried out, the finish will stand up better and be less liable to shrink and crack.

Stock Doors can be obtained in almost any size.

Entrance doors to rooms through which large pieces of furniture must pass should be not less than 2 ft. 8 in. wide by 6 ft. 8 in. high by 1⅜ in. thick, and can be made in four panels, similar to the old Colonial doors, or in cross panels, or in single panels. Cross-panel doors are generally used only in the service portion of the house. The doors should swing *into* the room and may swing from the right hand or left hand, whichever seems to offer the better position. Sometimes in the owner's chamber or the bathroom a large mirror is placed on the door. (In the illustration on page 21, a full length mirror is set in the panel of the closet door.) These doors can be finished in white to match the finish of the chambers; if of birch they can be stained to imitate mahogany.

In some sections of the country, where it is particularly hot in summer, a door made of slats, something like a shutter, is used in chambers, in addition to the solid door, so that the occupant can close the door and obtain privacy and yet secure good ventilation.

The outer entrance doors, such as the front door and back door should be 3 feet wide and made of heavy stock, preferably 1¾ in. thick or 2¼ in. thick, to withstand the action of the weather.

French doors are very attractive, particularly when used from the living-room to the piazza or between rooms that occasionally are to be shut off from the main portion of the house. French doors are usually made in pairs, divided into rectangular lights.

Dutch doors are sometimes used for entrance doors. They are divided into two parts, arranged so that the upper part can swing independently, leaving the lower part as a barrier to prevent small children from getting out of the house, while the open upper part lets in air and light.

Hardware: This is divided into two kinds, the rough building hardware, consisting of nails and spikes, and the finishing hardware which is used in the interior, such as locks, knobs and hinges. There are many kinds made in various grades and at various prices that will be impossible to describe here, but an examination of the varieties in the shops will enlighten the owner considerably. If not experienced in the selection of hardware, the owner will have to depend on his architect, builder or the dealer. Cheap goods are not advisable. I would advise that glass knobs be used in the principal rooms of the first and second floor. Nickel-plated hardware is best in the kitchen, service portion, and bathrooms.

Painting

SOMETIMES a poor job of woodwork can be improved in appearance by good painting, and poor painting can easily spoil good woodwork, so that painting is quite an important item.

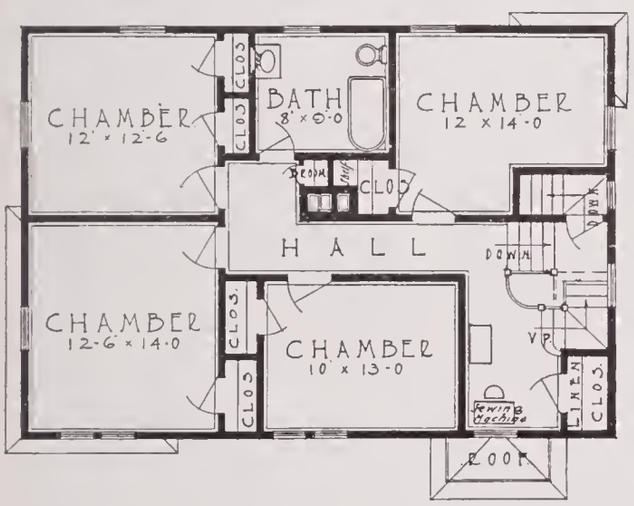
Skilled workmen should be employed, and only the best of materials. It is customary for the architect to specify that the paint materials shall be brought to the job in sealed packages and cans so that they may be inspected, and the possibility of adulteration prevented.

Fillers: A filler should be used on certain kinds of standing woodwork to form a base for a substantial finish. The following are open-grain woods, and should be filled: Oak, ash, mahogany, baywood, chestnut, black walnut, and butternut.

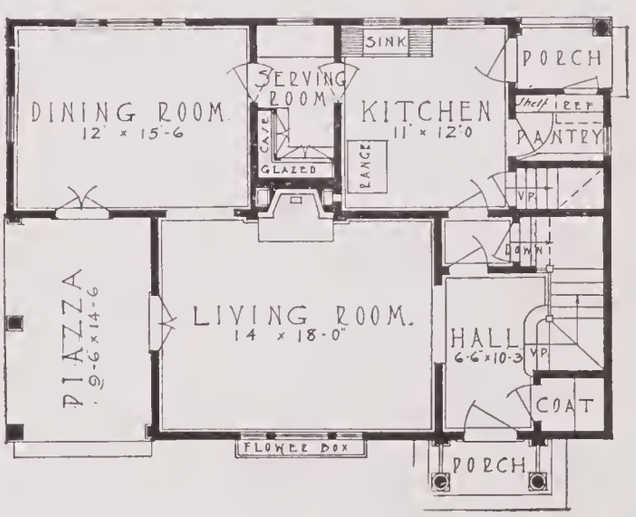
The following woods have a close grain and should *not* be filled: White pine, whitewood, Southern pine, red cedar, basswood, birch, cherry, maple, holly, and magnolia. In cypress, owing to the peculiar nature of the wood, the quantity of resin and methylene which it contains, it is necessary for interior work to use a coat of stain, followed by a coat of shellac, to be lightly sandpapered in twenty-four hours, over which apply one or two coats of finishing varnish.

Kitchen and Bathroom Floors: Apply two coats of floor varnish. This preparation is more of a floor dressing

This little house (similar to that on page 10) has a shingled exterior with a high roof. It has excellent service arrangement, including the combination rear staircase.



Second Floor



First Floor

than a floor polish. When floors are subjected to constant hard usage, it is absolutely necessary that they be frequently scrubbed with soap and water. Floor varnish preserves the wood, preventing it from becoming soft and gray from the constant action of soap and water. If linoleum is to be used over the wood, varnish the linoleum instead of the wood.

Birch: Carefully selected wood of this variety, finished with floor wax, makes a very handsome floor. A great deal of it is so uneven in color, however, that it is seldom used.

Hard Pine: For upper chambers and halls where inexpensive flooring is desirable, hard pine, when properly finished, will give good satisfaction. Soft or white pine should not be used. Floors complementary to the trim of the rooms are desirable. Borders should

vary in width to suit the size of the rooms. When a Colonial effect is desired, the pine can be painted with two coats of lead and oil.

Oak and Ash: On these and all open-grained hardwoods, apply one coat of paste filler. Thin the filler with benzine or turpentine to the consistency of flowing varnish, and apply no more than can be removed during hardening. Clean off surplus filler thoroughly. Allow at least twelve hours for the filler to harden after rubbing off, and then with a cloth apply a thin coat of prepared wax, and polish well with a weighted brush or dry cloth. Apply second coat in same manner after two hours. For final polish, place a piece of carpet under brush and rub thoroughly.

Maple: For this apply three coats of prepared wax, polishing each coat well with a weighted brush. As the grain of maple is very close, it would be of no benefit to apply a coat of paste filler. If a very high, hard polish is desired, apply a thin coat of white shellac before using the wax. Do not apply a stain. If a darker floor is desired, use orange instead of white shellac.

Pine and Fir: Apply a light coat of dark oak or mahogany water-stain and then a thin coat of white shellac. Sand lightly with No. 0 sandpaper, and apply two coats of wax, polishing each coat well with a weighted brush The appearance of a pine or fir floor is greatly improved by using a dark or mahogany stain. It is necessary to apply a thin coat of shellac in order to protect the stain. If it is desirable to finish these woods in the natural color, apply a light coat of white shellac and three coats of prepared wax only, polishing each coat well with a weighted brush.

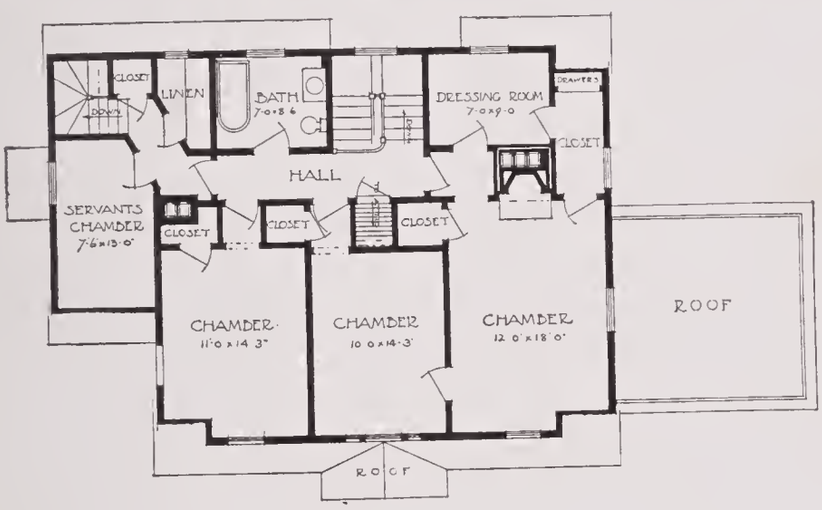
Heating the House

Various sections of the country have come to prefer certain heating systems, as in practice they have found them to be best adopted to that section, and I would advise the home builder to be governed thereby.

For very small houses: A stove in the kitchen and a stove in the living-room, with registers in the ceilings above, will satisfactorily heat the house. Next to the use of stoves and fireplaces a warm-air furnace with tin pipes conducting the warm air from the furnace to a register in each room is the most economical.

Hot-Water System: The most satisfactory heating system for an average-sized house, is, I believe, the hot-water or vapor-heating system. The radiators should be placed under the windows. The hot-air registers should be placed near the interior walls. I object to the use of steam for houses, because it varies so much and subjects the inmates to too great temperature changes to insure healthful living conditions.

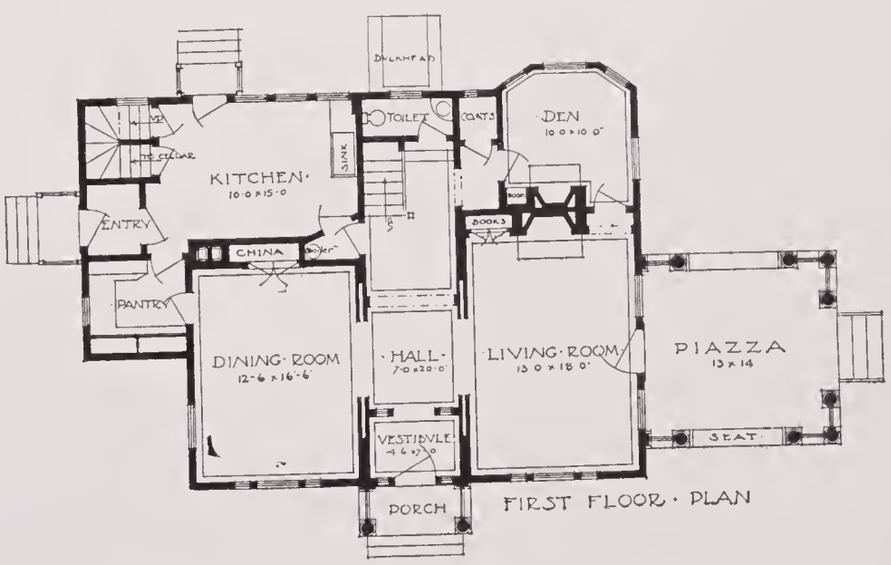
To obtain a good hot-water steam or vapor-heating system, it is first necessary to employ a reliable contractor who understands proportioning and balancing of heating mains and returns. Heating, to be efficient, is designed to heat the house to seventy degrees in zero weather with the minimum consumption of fuel, which means that the heat units or gases must travel around the heating surface of the boiler until their power is exhausted before passing into the chimney flue as waste. The laying out of a heating system for the house is not done by guesswork. It is customary to figure the size radiator required to heat each room. It takes so many feet of radiator or surface to heat so many cubic feet of air, the proportion of heating units to air space being determined by the climate and construction and exposure. When the radiators are computed on this basis, a boiler must be selected with sufficient capacity to heat this amount of radiating surface. The heating figured out on this plan is usually satisfactory, if properly piped. The radiators can be of cast iron or pressed steel. All pipes and fittings and valves should be of the best.



Second Floor Plan

THE *Colonial gambrel roof and interesting hooded entrances of this house make it unusually attractive. It is a good example of a compact small house as arranged by an architect.*

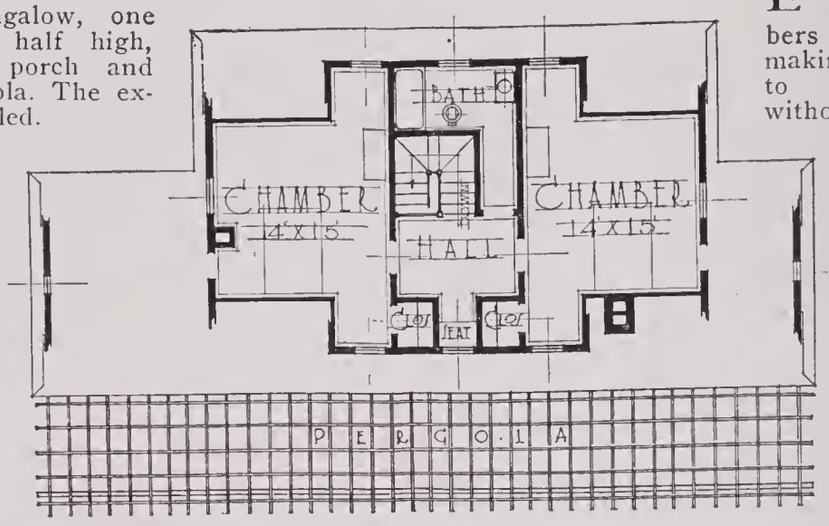
EVERY *convenience, including a den, is provided for on the first floor. The second floor contains three family chambers, ample closets, dressing room, bath, and maid's room. In the attic are two chambers.*



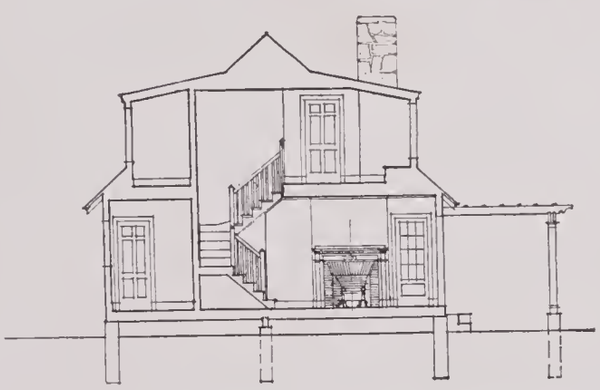
FIRST FLOOR PLAN

A well-planned and artistic bungalow, one story and a half high, with corner porch and trellised pergola. The exterior is shingled.

EACH floor has two chambers and a bath, making it possible to have guests without crowding.

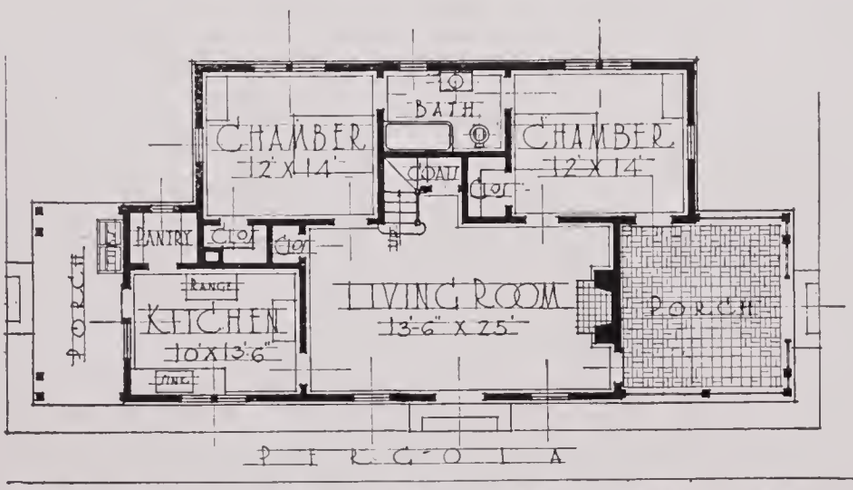


Second Floor



Section

End Elevation



THE dining-room and living-room may be combined, or one may have an alcove dining-room in the kitchen overlooking the side porch.

First Floor

Plumbing, Hot Water and Ranges

PLUMBING is so important that most towns and cities maintain plumbing inspectors to pass upon the installation, in order to protect the owner from a poor job. Select standard fixtures, and have a reliable contractor do the work. Plumbing is rather intricate to explain in such brief space, but I believe most people are familiar enough with fixtures to select those which suit them, and for the piping they must depend upon the plumber, unless the work is under the supervision of an architect. Brass pipes for hot water mains are advisable, and the very best galvanized wrought iron for cold water lines.

In every house the plumbing should be of the most sanitary type. The fixtures manufactured today are both economical and sanitary and are a great convenience to both the housekeeper and the family in general. Good plumbing contributes a great deal to the health and comfort of the occupants of the house.

It is customary to have the plumbing exposed under the lavatories and to have all exposed pipes nickel-plated.

The supply pipes to each fixture should be controlled by a shutoff valve, so that if the pipes become frozen or leaks develop, the water to each fixture can be shut off while repairs are being made, without impairing the rest of the system.

The Laundry should contain three wash trays, one for soaking, one for washing and one for rinsing the clothes.

In the Kitchen there should be an enameled iron or vitreous china sink about 20 inches wide by about 30 inches long with an enameled iron draining board at either side. In the serving-room there should be a copper sink for washing fine china, silver and glass. These sinks should be placed at a height convenient for the person who is to use them. In any event, be careful not to place them too low.

A Lavatory containing water closet and set bowl should be provided (if it can be afforded) on the first floor for the use of children or guests. This toilet-room should have a window for ventilation, and all bathrooms and toilet-rooms should be so planned that they receive light and air from the outside.

The Bathrooms: It is customary, today, to provide an owner's bathroom as well as a general bathroom for the use of guests and other members of the family. Each bathroom is equipped with a tub, preferably built in, a water closet, a lavatory, and in some cases, a shower either in a shower stall or hung over the tub and enclosed with a cotton curtain. Most bathtubs are also equipped with a shampoo fixture. The tub should be of enameled iron; the lavatory may be of enameled iron, but is more satisfactory if of vitreous china. The water closets should be of vitreous china with vitreous china tanks rather than of wood. In addition, the bathrooms should have a tile floor, and the walls should be wainscoted with tile. Over each lavatory there should be a medicine closet with a mirror door, and if the bathroom is large enough a small cupboard should be provided for towels, face cloths, and miscellaneous bathroom supplies. Bathrooms should be heated by a good-sized radiator.

Of course there are many very elaborate fixtures, such as sitz baths, foot baths and needle showers, that are not required in the usual house; at the same time there are many good inexpensive types of fixtures.

In the attic there should be a maid's bath, containing an enameled iron tub, a water closet and an enameled iron lavatory. The floor can be of wood and the walls plastered and enameled.

The supply of hot water is a very important factor in the house. There are two ways of obtaining this: The simplest method is to place a 50-gallon boiler in the kitchen and connect it with the water-back in the range; but where a continuous supply of hot water is required throughout the year, it is better to put a larger boiler, containing perhaps 100 or 120 gallons, in the cellar and attach it to a small coal tank heater, which can be kept burning all the time. This little heater will heat with a small consumption of coal per day, hot water enough for all purposes. This small amount of heat is also sufficient to keep the cellar from being

damp. The hot-water supply should be what is known as a circulating system. This will avoid having to draw cold water for two or three minutes before getting hot water. In many sections of the country the water is heated by an automatic gas heater placed in the cellar.

Cooking Ranges: The old-fashioned coal range is, of course, used in many houses, with a boiler nearby to furnish hot water, connected to the water-back of the range.

In many suburban localities gas ranges are very popular, and there are a great many houses where all the cooking is done by electricity. My own experience with an electric cooking range in two houses has been entirely satisfactory, but the use of electricity for this purpose depends, of course, upon the local rate charged for current.

Lighting the House

THERE is but one ideal lighting system to consider, that is electricity, furnished either by an electric light company or by an independent storage battery plant. The latter is more expensive than when current is purchased from a company. Acetylene gas systems are used in a great many isolated sections and are satisfactory. Gas is to be recommended, however, in preference to acetylene lighting if it can be obtained at reasonable rates. Some houses are wired for electricity and piped for gas, the gas and electricity being brought to an opening and a combination fixture being used so that either is available for illumination, but this practice is being discontinued, and electric lights are being used in preference.

The electric meter should be placed in the cellar near a window, so that it can be reached from the outside and shut off in case of fire. In some sections it is required by law to be placed on the back porch.

Location of Lights: The problem of proper lighting requires careful study. The lights must be located in relation to the position of the furniture and with thought as to how they are to be used.

To-day, nearly all lighting in houses is by the use of side lights or brackets and by portable table lamps. On account of the desirability of changing the position of the furniture from time to time, the portable lights are attached by a cord to a plug in the wall, this method having been found to give more latitude in rearranging a room according to one's desires.

Chandeliers are very seldom used to-day except in rooms with very high ceilings as it is difficult to obtain a well-proportioned and beautiful chandelier for a ceiling only nine feet high.

Lights should be placed about 5 ft. 6 in. from the floor. All ceiling lights should be on switches, and the lights in halls and on stairs should be arranged so that they can be controlled by switches from the floor above and the floor below.

The eye strain is lessened when wall brackets or chandeliers are shaded with silk or vellum shades, therefore it is much better to illuminate a living-room by portable reading lamps than by ceiling lights. All large closets should have a light in the ceiling, operating preferably by door switches, although this is in the nature of a luxury. It is also advisable to have all the cellar lights on one switch in small houses so that no one will have to go into a poorly lighted cellar at night. As a protection against burglars, all lighting circuits can be connected on one master switch, placed at the head of the owner's bed so that the whole house can be illuminated by turning the switch.

Plugs: In the laundry there should be a plug for an electric iron, and plugs should be placed in the baseboard of each room and hall, to be used for portable table lights or for portable vacuum cleaners, while in the dining-room and kitchen they may be used for electric cooking devices. Put in plenty of plugs, even if you don't need them all at first.

Lighting Fixtures: These should be selected from a reliable manufacturer. They are rather expensive, but a very good selection can be made if care is used. The client can safely follow the manufacturer's advice if, again, he is without an architect.

A Colonial house of unusual dignity that depends on no ostentatious ornamentation to distinguish it from the ordinary types.

Constructing the Small House

THE foundations of a small house must be designed and constructed carefully. In many sections of the country various materials are used for foundations, and in each locality there is one material which is the cheapest; but in the majority of places concrete seems to be the most satisfactory, with local stone a close second.

Foundations: If the wall is of stone it is about 14 or 16 inches thick. If of concrete it need be only 12 inches thick. Concrete foundations are usually the most economical except where stone is abundant. In some cases where the soil is very light and well drained, hollow tile, concrete blocks or brick can be used; but where the soil is mixed with clay it is important to have a very good foundation made water-tight, with 4 in. tile drain laid at the bottom of the wall or on the outside of the wall, to carry off any surface water that may accumulate on the cellar floor. The floor of the cellar is usually laid after the house has been framed and roofed. It should be in two parts, first a foundation of brickbats, gravel and small stone about 4 in. thick, grouted with concrete and then finished with a cement top from 1 to 1½ in. thick.

The Frame House: In considering the material of which the house itself is to be built, the owner must decide between masonry and frame. The majority of houses are built of wood because it is cheaper. Wooden houses are fully as attractive as masonry houses and just as many charming effects can be obtained, depending upon the skill of the designer. A frame house is constructed more rapidly and easily than a brick house, and many claim that frame houses are healthier to live in. If a frame house is decided upon, the lumber must be well seasoned. The frame is usually of spruce. It should be seasoned material, air dried; in other words, the shrinking should take place while it is piled in the lumber yard rather than in your house, because any shrinking in the frame after the house is erected will cause cracks in the woodwork and plaster.

The majority of frame houses today are built with a *baloon frame.* Years ago it was customary to erect a mortised and tenoned frame, in which very heavy timbers were used at the corners and at the line of the second floor joist, thoroughly braced in all angles, but recently the balloon frame has been adopted generally; it consists of lighter material securely nailed and will be found to be entirely satisfactory. This framework is covered on the outside with boards, then carefully covered with building paper well lapped and brought tightly around all doors and windows to keep out the wind. Over this are placed the shingles, weather boarding, siding or clapboards, as the owner may choose. The exterior finish of the house is usually of white pine or cypress, for these

two woods are particularly durable when exposed to the weather.

Stucco House: The second type of construction that is very popular is the stucco or cement-plastered exterior. The house is framed, boarded, and the exterior covered with an extra-heavy waterproofed paper. Over this is placed metal lath on metal furring strips; in some cases metal lathing is used with wood furring strips, but I prefer the metal as it is less liable to shrink and crack the plaster. The metal lath is covered with the cement, which is applied in three coats. The first coat imbeds the metal lath, and the second coat is applied with a fairly smooth surface. When this is hard, a third coat is applied, and may be either of a very rough texture called rough cast, applied by throwing the fine mixture on, or smooth texture made by applying the finish coat with trowels and smoothing it off to give a coarse sand finish. Stucco can be obtained in various colors, but white, natural gray and light tan are the most popular.

Brick Veneer: In the order of their cost the next type of construction would be the brick veneered, which consists of framing the house with the balloon frame, the same as for the first type, and covering the frame with boarding, and then practically veneering the exterior of the house with four inches of brick. The bricks are tied to the boarding by means of metal ties, and when completed the effect is that of a solid brick house. Since we are considering inexpensive types of construction, these are the only two I will describe in detail.

A Brick House today affords many possibilities, for the brick manufacturers have recently produced many shades, textures and finishes that produce very harmonious results when properly used. Of these, Tapestry brick is the best known. The dark red Harvard brick is the best suited for Colonial houses. Light gray bricks are effective when used in other styles, but they are not suitable for the Colonial.

Other Outside Materials: The construction of a stone house, or reinforced concrete house, or a tile house, should be under the direction of an architect.

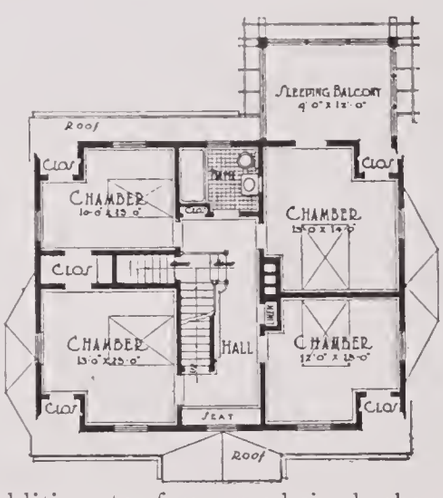
Hollow tile houses are similar to brick houses, that is, the walls are built of hollow tiles and the exterior is covered with cement plaster. Houses with the exterior walls of concrete blocks are used in some sections of the country; but unless the blocks are cast with an air space the walls are apt to be damp.

The Roof: The permanence of materials should receive careful consideration, as well as their fireproof qualities. The roof may be of wooden shingles, asbestos or composition felt. A tile or slate roof should always be used with a brick or stucco house, bearing in mind, however, that a slate

The charming living-room in the little cottage illustrated on the opposite page. French doors at the end open on to the rear porch.

A gambrel-roofed cottage with shingled roof and stucco walls.

Spacious, yet compact, this first floor plan is well worth careful studying.



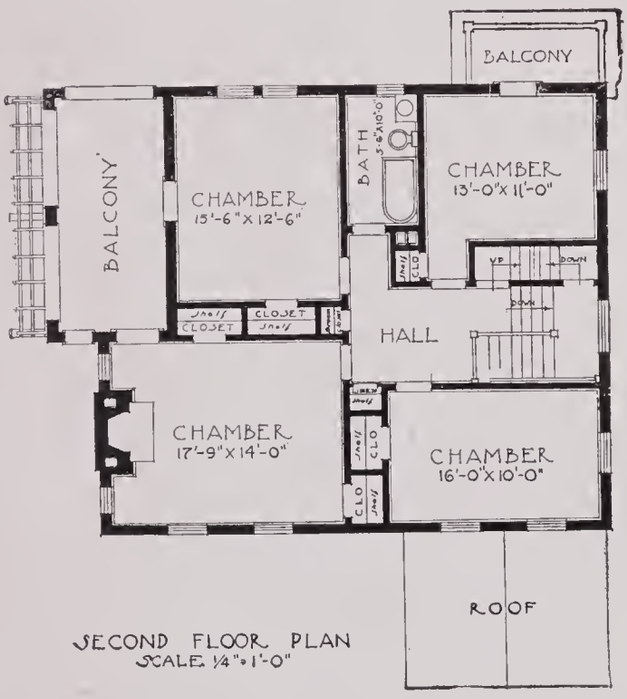
In addition to four good-sized chambers, the second floor boasts a sleeping porch.

roof is preferable for a Colonial house where a tile roof would be entirely out of place. A slate roof is a protection against fire from chimney sparks or firebrands from a nearby fire. Flat roofs should be of canvas laid in white lead and oil paint.

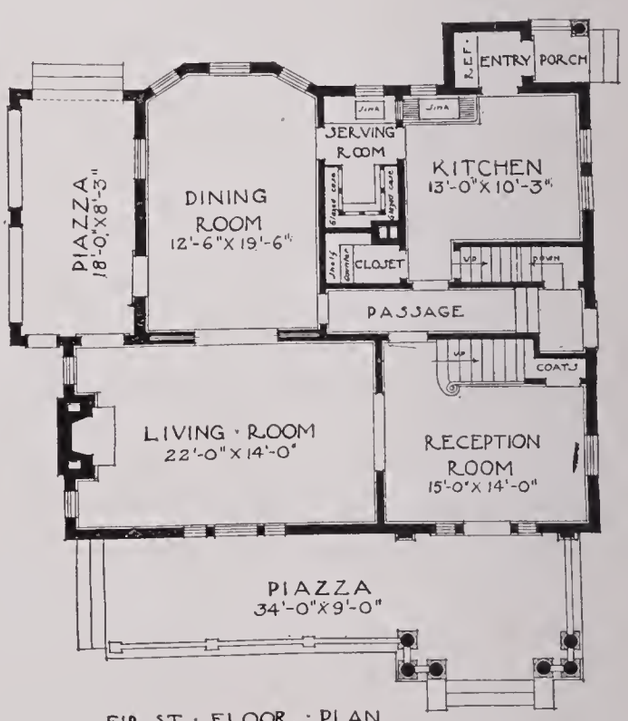
Fireproofing: In frame houses it is customary to place a course of bricks over the sill, level with the first floor, to prevent fire from being drawn from the cellar into the spaces between the studs. If the spaces between the studs at each floor are stopped off with a course of brick, and if in construction care is taken to close off the spaces under stair openings with brick or metal lath and plaster, it not only prevents these spaces from acting as flues for fire, but it also prevents mice from getting into the walls.

Frequently fires are caused in houses from ashes being put into wooden barrels, or from waste paper being put into wooden barrels at the foot of the cellar

A RED *brick Colonial house—the white columns and woodwork standing in relief against the brick walls are very pleasing. The roof is slate and the blinds are painted green.*



SECOND FLOOR PLAN
SCALE 1/4"=1'-0"



FIRST FLOOR PLAN
SCALE 1/4"=1'-0"

THE *plan is unusually well worked out—the dining-room and living-room open up well and the position of the dining-room is good on account of the privacy it obtains and its relation to the rear piazza. The second floor contains four good chambers and a balcony or sleeping porch opening from two rooms.*

stairs, and hot ashes thrown into them. The fire, once started, makes quick progress on the first floor joists, and up the cellar stairway, so have the cellar stairs closed at the top with a door. If the stairs are made of plank and left open at the sides, with the exception of the hand rail, the fire will travel more slowly. If the ceiling is plastered on metal lath it is an additional prevention, and the ceiling should be plastered over the furnace and over the smoke pipe for this reason.

The Cellar should contain a well-lighted laundry with wash trays of enamel, iron or soapstone. (See Plumbing page 29.) The cheap wash trays which are made of cement are not very durable. There should be a small platform of slats in front of the wash trays so that the laundress will not have to stand on the damp floor.

In some sections of the country, particularly the farming section, it seems advisable to have the laundry adjoining the kitchen on the ground floor, with a woodshed adjoining the laundry. This is preferable to the cellar laundry; but in cases where both land and buildings are very expensive, it it not economical.

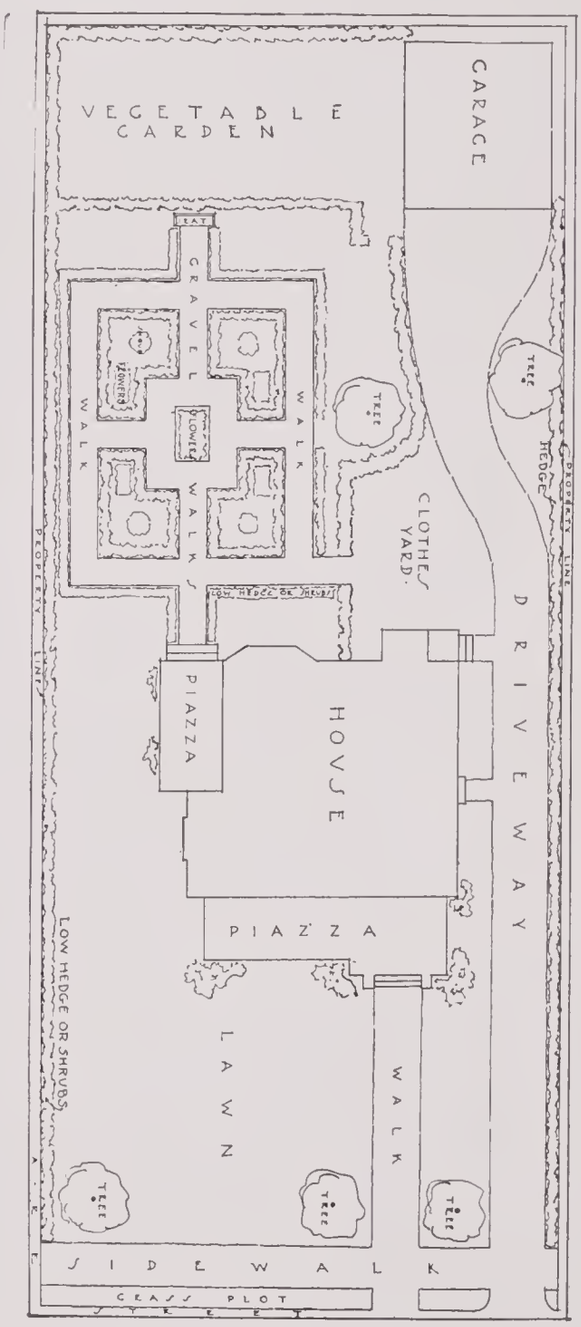
There should be a small toilet-room in the basement, which is not expensive, as it can be attached to the main plumbing system.

One vegetable and preserve closet should have a window well away from the heater, without any heating pipes passing through it. If it can be enclosed in brick walls and dry air allowed to circulate through it from the outside, the vegetables and preserves will keep much better.

Coal bins should be placed so that the coal can be put in through windows easily reached on the outside, and each bin should hold a year's supply. A ton of coal occupies from thirty-five to forty cubic feet of space.

Plastering: The old-fashioned method was to lath a house with wooden laths, over which two coats of very ordinary plaster was applied. In many sections the old-fashioned wood lath is still used, and it is satisfactory; but I believe that plaster boards are to be preferred, because they are slow burning and they permit the mason to obtain a smooth finish without depressions or irregularities. In some houses, usually expensive ones, the plastering is done on metal lath, which is preferable to either of the above mentioned ways. To obtain good plastering you must have good material and good workmen. They must take care to put on the last coat so that it is perfectly straight. Wall board or a composition board is now used quite extensively; but I believe that plastering is more desirable.

Casement Sash: Casement sash is a type of window commonly used in England, France and Italy. These windows usually swing out, and have an advantage over double-hung windows in that they open up the full area. But in Europe screens are seldom used, and windows are set in deep recesses or



A typical plot plan of the grounds for the house in the illustration opposite, showing a simple landscape treatment that is not expensive. This lot is 75 x 175 feet deep.

jambs, so that the curtains hang far enough away from the sash to permit the windows to be opened into this recess without disturbing the curtains. Our frame houses with thin walls do not permit of this treatment.

Blinds: The blinds may be the common, ordinary type usually found on frame dwellings; but I would suggest a heavy shutter having solid panels, on the first story, with a half moon, diamond or heart cut in the top panel. They are very good for closing up the house, besides being very decorative. The blinds on the second story can be made in two panels with slats.

Sleeping Porch: Few houses are built today without a sleeping porch. Sometimes, where a very small porch is desired, it can be constructed inexpensively over the back porch and can be enclosed with canvas screens and roofed with a light roofing. I have found, however, that the most satisfactory sleeping porch is about the size of an ordinary chamber and is built over a sun parlor or side piazza. (See houses, pages 11 and 33.) The room is then plastered and equipped on its three sides with glazed sash, so that the amount of fresh air desired can be regulated. This room being built onto the house and not being heated, is very satisfactory, because it can be used with all the windows closed as a very comfortable chamber, and yet, when it is opened, the cold air cannot chill the interior of the house. It also provides a roof for the sun porch, which should also be enclosed with glazed sash and doors so that it may be opened on mild days and closed on cold days. During the day the sleeping porch with this sash will be warm enough to be used as a children's playroom, and the air will be healthily fresh in either of these rooms.

Piazzas: The large piazza placed at the south side is much better than if across the front, restricting the use of the front porch for entrance only. Another smaller piazza off the dining-room may be used as a breakfast porch, and enclosed in the winter and used as a conservatory. The large piazza would be of considerable value in winter if enclosed in glass, and with this in mind it would be well to have a radiator in it.

On the porch heavy, old-fashioned settees or seats may be used with good effect; and if made separately, they can be moved wherever desired.

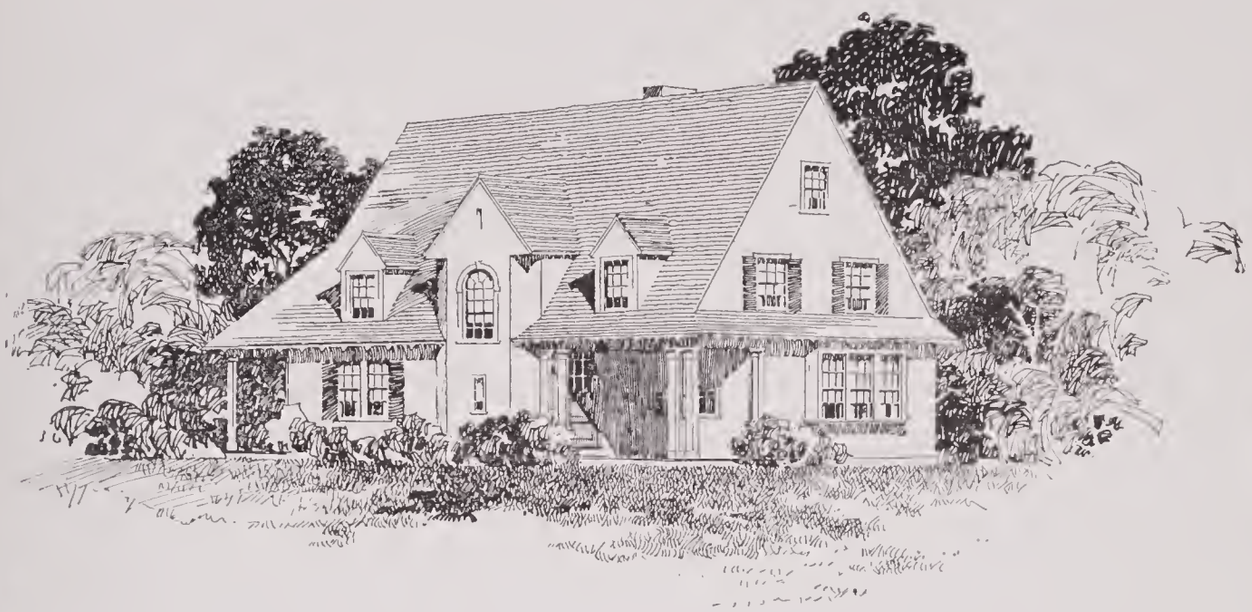
Porch Floors: In inexpensive houses it will probably be necessary to construct the porch floors of Oregon fir or Georgia pine with steps of the same material. Where the piazza is enclosed with glass, to be used as a sun parlor in the winter, it is advisable to have a concrete foundation under it. The floor may then be of reinforced concrete or tile laid on concrete slabs or on cinder fill. This is far more expensive, but adds greatly to the appearance of the sun parlor. The floors of sleeping porches may be of cypress or hard pine, fir or canvas.

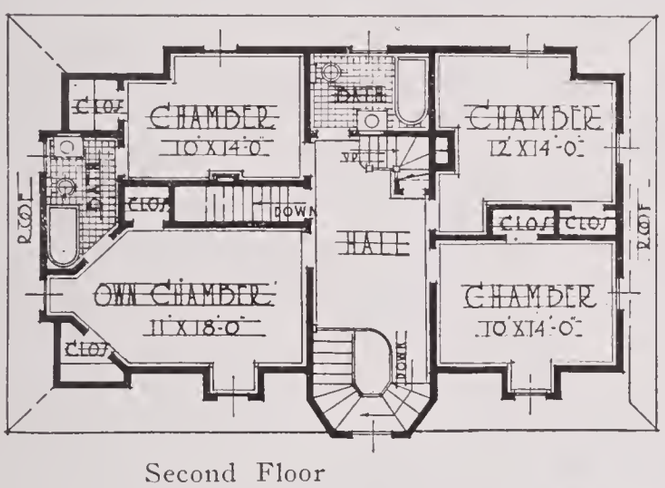
Estimates and Payments

NOW that we have settled upon the site, and considered the arrangement and necessary details to be thought of in connection with the house. the final important question is that of getting estimates.

A reliable builder would rather figure on an accurate and complete set of plans in competition with other good builders than to give a figure on poor plans, knowing that he must add a large extra percentage to protect himself against being called upon to supply deficient parts not shown on the plans. The unscrupulous contractor, who knows this, but puts in a low figure without any fund for contingencies, plans to hold to the strict interpretation of the plans, and will not put one cent's worth more than your incomplete plans call for. By law you have no redress.

The cost of building depends also upon the construction, its finish, quality and kind, the painting, the plumbing, and whatever enters into the building to make it complete. There is, however, a choice which, while not the best, is not the poorest, and gives a satisfactory result, intelligently handled. Here again the architect's advice and economical handling warrants his fee, and actually saves it in the selection of good inexpensive materials and finishes.



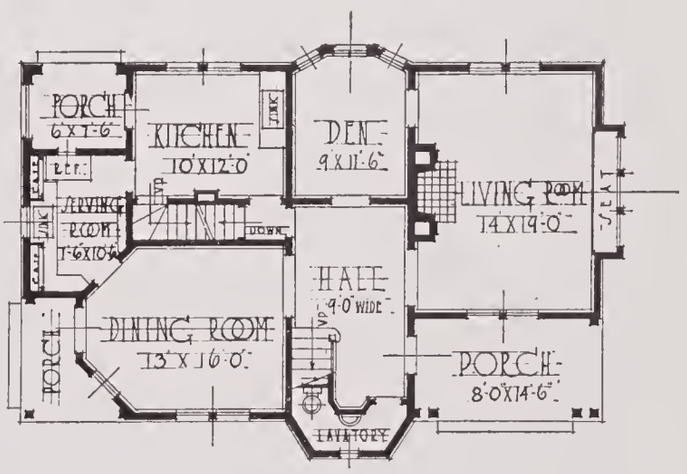


Second Floor

THE *intangible touch of the architect makes this design unusual and interesting with sharp gables and stucco walls.*

THE *first floor arrangement meets all the modern requirements of good planning, the rooms all opening up well from the hall. The second floor contains the usual four chambers and two baths with ample closets. The attic contains two chambers.*

First Floor



While the first estimate of cost may not be exact, it must be definite enough to establish a basis upon which to decide whether the expenditure is warranted by personal needs or as a profitable undertaking. The units making up the total cost of building are definite; but generally the client's requirements are not, and as they form the basis of cost they must be settled upon first, or you should permit your architect to modify your requirements to come within your appropriation.

The Locality Factor: I have found that between New England points and some sections of the South there is a difference of fifty per cent in the cost of building the same house. Figures can not be given that will give the standard ratio, because the cost of building fluctuates according to the supply and demand.

Another factor of cost is found in the difference between rural sections having no building laws, but cheap labor and native material, and cities having build-

ing laws, organized labor, and the best building material, with the additional overhead expense necessary to carry on business in the city which increases the cost from 10 to 25 per cent. This analysis, however, will indicate the difference of cost between widely separated sections, and between cities and their adjacent localities and explains some of the mysteries of wide differences of cost.

Some sections of the country have not progressed as rapidly as others; their standards of building are lower, and they are not exacting in details of refinement and comfort. In many rural sections they are very careless about building; while in the large commercial centers where the greatest progress has been made, the standards of building are very high, established by well-fixed building regulations covering construction, as well as the demand for well-built and up-to-date houses by those who can afford to have the very best.

Many of the necessities and up-to-date equipment found in homes costing from five thousand dollars upward would be considered by those living in rural sections as absolutely unnecessary for their comfort or mode of living.

Other Conditions: The cost of building fluctuates with the prosperity of the country, with a fixed wage where organized labor is controlled by the unions, and the fluctuating wage scale in other sections regulated by the demand for labor. The price of all building material is regulated by supply and demand. Therefore the man who has money in the bank and can build during hard times, would obtain everything at minimum rates. These conditions and the amount of competition determine the cost to you.

Competition: This is necessary in order to obtain the lowest figure; that is, the owner after having procured his plans, specifications, and details, should place them in the hands of four or five responsible contractors for bids—the job going to the lowest bidder.

Most small houses are built *under contract,* which means that the contractor names the price for which he will erect the building complete. This is probably the safest method for anyone building a small house, as it is important that he should know beforehand the amount he will be called upon to expend. But bear in mind that even under a contract this price can be exceeded if you make changes or add extras.

The other method of building is known as *day work,* under which scheme you select a reliable builder who proceeds to build the house from the plans and specifications which you furnish him, rendering you bills each month for the net cost of all labor and material used in the house that month. You agree to pay him, in addition to this, a commission of usually 10 per cent as his compensation. If you employ an architect he will obtain the bids and advise you concerning these matters more in detail.

Bids will vary greatly; the lowest figure being accepted and a contract signed, you know what your house will cost, provided you do not incur extra expenses by making changes while the house is being built. So you can readily see that the only accurate way to obtain an exact estimate is to obtain bids on the plans and specifications. An approximate estimate may be made by comparing these bids with the known cost of some house of similar dimensions and construction recently built in your section.

The cost of alterations and additions to existing houses is another source of annoyance, because the attendant difficulties of tearing out the old work and matching and joining the new work is more expensive than a piece of new work without the attendant handicap. A certain portion of the cost of alterations gives no return,—such as the cost of demolition, the cost of renewing perfectly good work that is damaged during the alterations, such as loosening ceilings, marring floors and finish, the subsequent cost of refinishing and painting work that was perfectly good, the expense of redecorating damaged walls, leveling up old floors and boring through the construction in order to run new wire and pipes from the old work to the new.

Payments: In making monthly payments the owner should not be called upon to pay to the contractor more than 85 per cent of the labor and material actually used during the month. This leaves a balance of 15 per cent, which the owner retains until the building is completed, at which time these balances will represent 15 per cent of the total contract price. This should be paid to the contractor with any extras that have been authorized, upon satisfactory

evidence given by the contractor to the owner *that the contractor has discharged all debts for labor* and that the building is not subject to liens. Be very sure of this last point.

Payments on the building are made direct to the contractor upon the certificate of the architect. This method gives the architect control of all the details and places him in the position of an adviser and arbitrator, which is to the mutual benefit of both owner and builder.

The contractor is employed by the owner to execute a contract, through the the architect, the builder addressing the owner through the architect, or the owner addressing the builder in the same manner.

In some sections of the country, the payments on a small house are arranged as follows: The owner agrees to pay for the house in, let us say, five payments, arranged as follows: First payment to be made when the cellar is in; second payment to be made when the house is up, closed in and roofed; third payment to be made when the interior is plastered; fourth payment when the house is finished, and the fifth payment, which represents the balance due on the contract and any extras, thirty days after the house is completed, subject to the owner's approval and after the contractor has furnished evidence that the owner will not be liable for any claims for material or labor furnished on the job and not paid for by the contractor.

A Final Word: Remember that the construction of a house is really a very simple undertaking, but, like many other things that are not fully understood, the client is apt to be worried by unforeseen handicaps—such as delays or bad weather, both of which are bound to occur. Possibly he will not be able to tell whether the work is good or bad, but he should not expect to obtain the highest degree of perfection unless he pays the prices necessary for employing the most skillful men and purchasing the finest material. There is, however, a reasonable degree of perfection that should be obtained, and the owner should be fair in determining what is due him under the contract. It will aid a great deal if all materials and fixtures can be selected and ordered early in order to avoid delays.

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